

Is Micronesian a linkage?

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Outline

- 1 Trees and waves
- 2 Data and methods
- 3 Results
- 4 References

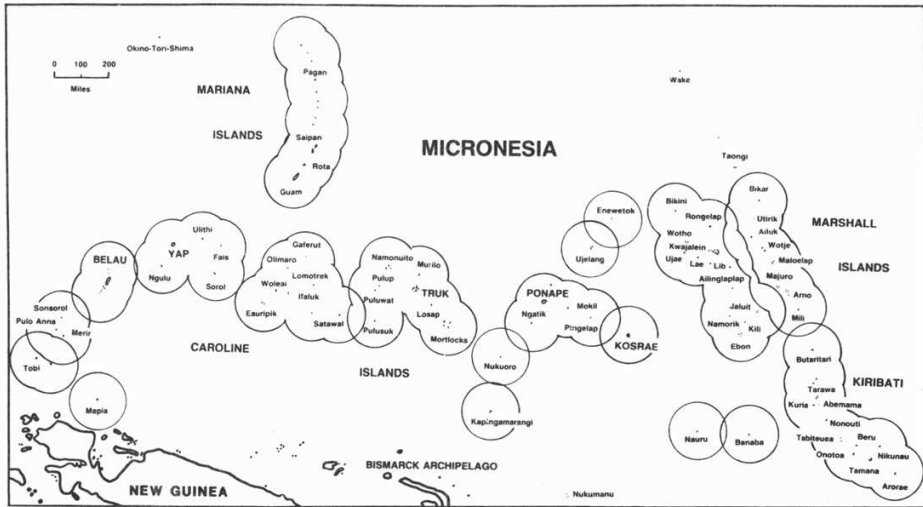
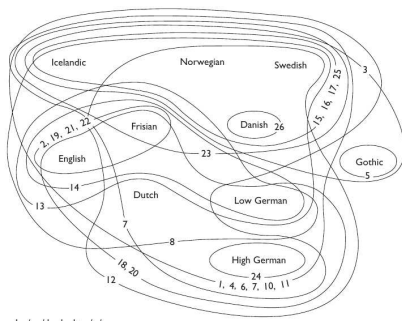
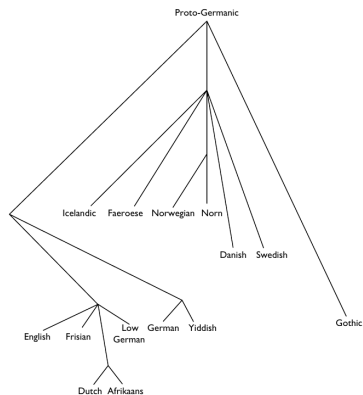


FIGURE 1.

(Marck 1986)

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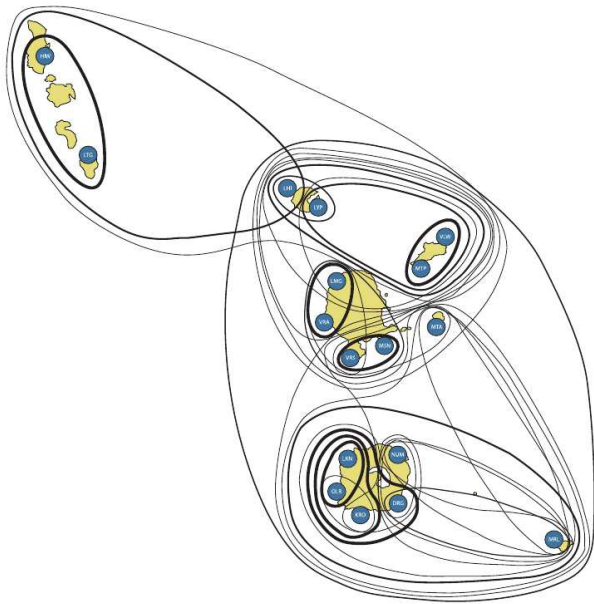
Diagrams from Trask 2015:



- The fewer intersecting isoglosses, the more tree-like the structure

Mechanisms by which dialect groups arise (e.g. Ross 1988, see also Jacques and List 2019; Kalyan and François 2019):

- **Separation**: loss of contact between parts of a formerly unitary community, resulting in a tree-like structure
- **Differentiation**: gradual accumulation of differences between communities in contact, resulting in a wave-like structure
- Ross' (1988) term **linkage** refers to networks or chains of dialects that arise through differentiation
- While higher levels of the Austronesian tree show clear branching, most low-level subgroups of Oceanic are linkages
- “[I]n early Oceanic, dialect differentiation and network-breaking were the rule rather than the exception” (Pawley and Ross 2006)
 - Fijian (Geraghty 1983), Western Melanesia (Ross 1988), Malaita (Lichtenberk 1988), Vanuatu (Clark 2009; François 2011a,b), Polynesian (Walworth 2014, Walworth and Davletshin 2019) etc.



A glottometric diagram of North Vanuatu (Kalyan and François 2019, p. 172)

- No reason to think that Micronesian is any different
- Near-simultaneous settlement of major high islands about 2000BP
- Maintenance of interisland contacts for at least some time
- Eventual network-breaking and differentiation
(Athens 2018; Kirch 2017)

Earliest East Micronesia ¹⁴C Dates

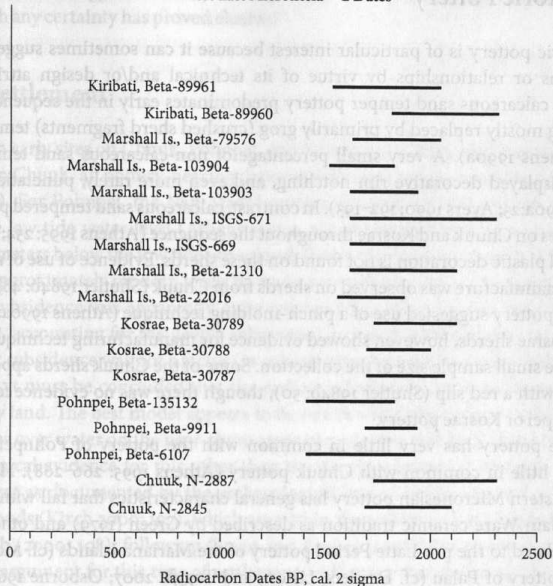
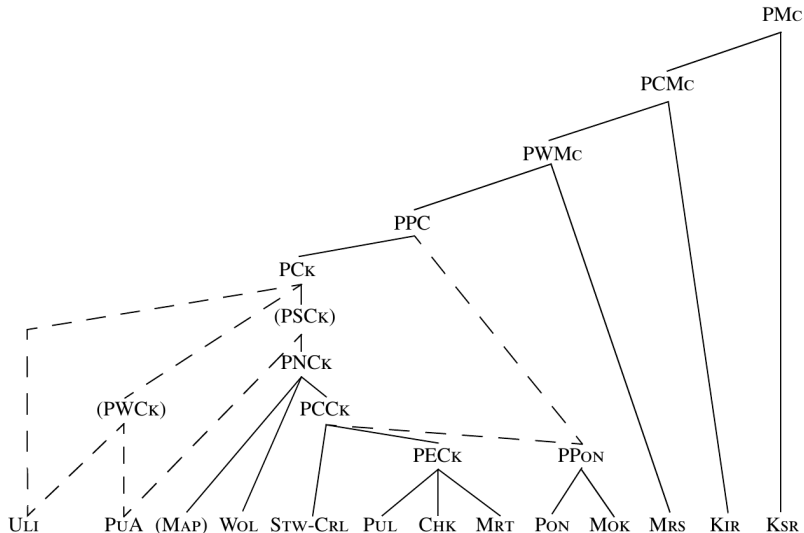


FIGURE 13.3 Graph of the two sigma calibrated ranges of the earliest archaeological radiocarbon determinations in eastern Micronesia. They collectively suggest that initial settlement over the entire region occurred between about 1,800 and 2,000 cal. B.P.

Micronesian



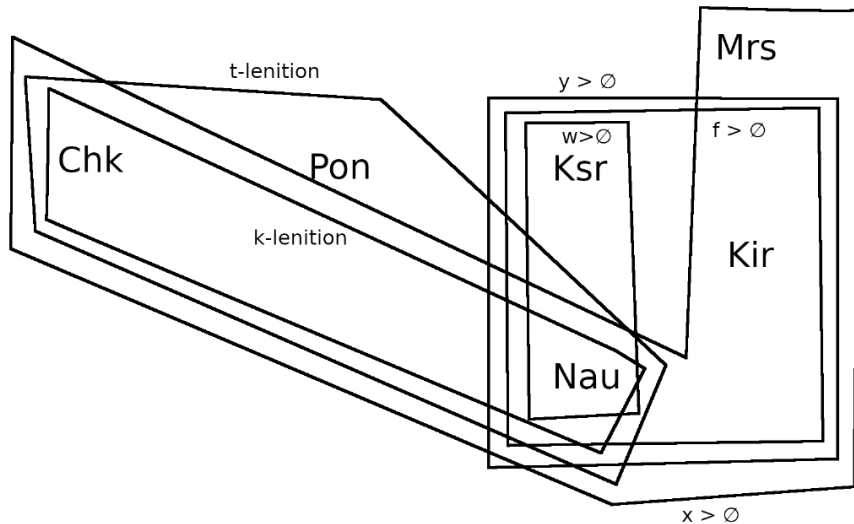
Micronesian language family, Bender et al. 2003a, based on Jackson 1983

A literal reading of the tree implies that “Micronesia was settled by a series of discrete moves through the islands, and that at each point where we identify a subgroup, there was a pause of sufficient duration to allow a unique set of innovations to develop by which we can identify the subgroup. **This seems to me to be unlikely as an account of the settlement of the entirety of this region.**” (Rehg 1995)

Other works that critically examine the structure of the tree:

- Marck 1986, 1994, Hughes 2020a,b, Blumenfeld 2022, 2024

Evidence from sound change



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The MCD (Micronesian Comparative Dictionary)

- Individual language dictionaries: Pohnpeian, Woleaian, Chuukese, Carolinian, Marshallese, Kosraean
- Comparative work over several decades, culminating in Bender et al. 2003a,b
- Steve Trussel's online version of Bender et al. 2003a
- CLDF conversion undertaken last year: Bender et al. 2023
 - <https://zenodo.org/records/7973420>
- Work in progress: integration with the ACD (Blust et al. 2023)
- Goal for today: a preliminary look at what the MCD lexical data tells us about the internal subgrouping of Micronesian languages

Task: examine innovation-based lexical isoglosses and what they tell us about the internal structure of the Micronesian family

- Kalyan and François' (2018) measures. For each subset of languages:
 - e : exclusive isoglosses
 - p : supporting (possibly non-exclusive) isoglosses
 - q : conflicting isoglosses
- “Subgroupiness”: the proportion of supporting isoglosses among all relevant isoglosses, scaled by the number of exclusive isoglosses

Subgroupiness (Kalyan and François 2018, p. 70)

$$s = e \frac{p}{p+q}$$

- Raw counts are uninformative, because they depend on data quality: a language with good coverage will enter into more isoglosses
- Thus, calibration: compare observed distribution of reflexes to a statistically random distribution (as if there were no internal structure or subgrouping of any kind)
- I.e. pretend reflexes are the same in number as in the MCD but are randomly distributed between cognate sets, and calculate the **expected** value for each of K&F's measures for each subset of languages (expected number of exclusive isoglosses, expected subgroupiness, etc.)
- The observed/expected ratio gives a better clue about internal subgrouping than raw counts of isoglosses

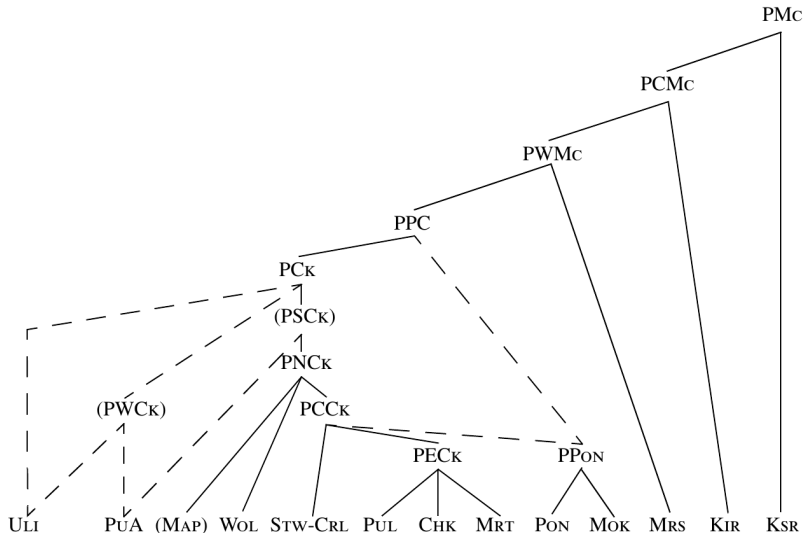
- We are not interested in isoglosses based on retentions
- E.g. reflexes of PMC *kanawa 'Cordia subcordata':
 - CHK *anaw* 'Cordia subcordata'
 - MOK *kanaw* 'tree sp.'
 - MRS *kōŋo* 'Cordia subcordata'
 - NAU *eongo* 'Cordia subcordata'
 - KIR *kanawa* 'a tree'
- This set tells us nothing about subgrouping, because it is a retention (POC *kanawa, PMP *kanawa)
- So we only consider those MCD cognatesets that have no external comparison (1125 sets out of 1723)
- This does not entirely exclude retention-based isoglosses but reduces their number by removing sets guaranteed to be retention-based

- The analysis below includes the following languages: Kosraean, Nauruan, Gilbertese, Marshallese
- Pohnpeic (3 languages) and Chuukic (about 10 languages) are (relatively) well-supported subgroups within Micronesian, and are treated as single languages
- Nauruan: comparisons from Blumenfeld 2022 are included, but there are very few pairwise comparisons between Nauruan and other languages, which introduces a bias against Nauruan subgrouping with any individual language (more on these issues below)

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Micronesian



Micronesian language family, Bender et al. 2003a, based on Jackson 1983

Is Central Micronesian a strong subgroup?

SUBG	<i>e</i>	<i>p</i>	<i>q</i>	<i>s</i>
CPMK	4.13	7.33	1.14	21.58
CPMG	3.08	6.56	1.16	13.38
PMGK	1.33	10.17	1.31	9.75
CMGK	1.6	7.88	1.22	8.91
CPGK	1.75	6.55	1.18	8.34

C=Chuukic; P=Pohnpeic; M=Marshallese; G=Gilbertese; K=Kosraean

e: exclusive

p: supporting

q: conflicting

s: subgroupiness

Is Western Micronesian a strong subgroup?

SUBG	<i>e</i>	<i>p</i>	<i>q</i>	<i>s</i>
CPK	1.24	3.14	1.15	2.9
CPM	1.26	2.97	1.19	2.59
CPG	0.9	2.66	1.13	1.8

C=Chuukic; P=Pohnpeic; M=Marshallese; G=Gilbertese; K=Kosraean

e: exclusive

p: supporting

q: conflicting

s: subgroupiness

Other three-member subgroups

SUBG	<i>e</i>	<i>p</i>	<i>q</i>	<i>s</i>
PMK	1.63	4.63	1.15	5.68
CMG	1.2	3.29	1.18	2.87
MGK	0.8	4.29	1.11	2.79
CMK	0.92	3.52	1.27	2.29
PMG	0.67	3.64	1.29	1.67
CGK	0.5	2.97	1.19	1.14
PGK	0.25	3.48	1.26	0.64

C=Chuukic; P=Pohnpeic; M=Marshallese; G=Gilbertese; K=Kosraean

e: exclusive

p: supporting

q: conflicting

s: subgroupiness

Two-member subgroups

SUBG	<i>e</i>	<i>p</i>	<i>q</i>	<i>s</i>
CG	1.32	1.78	1.42	1.54
CP	1.31	1.74	1.5	1.43
CM	0.63	1.66	1.57	0.65
CK	0.56	1.64	1.49	0.6
PM	0.29	1.84	1.43	0.35
MG	0.25	1.93	1.32	0.34
PK	0.24	1.95	1.34	0.32
MK	0.15	2.19	1.23	0.24
GK	0.17	1.69	1.31	0.21
PG	0.13	1.53	1.52	0.13

C=Chuukic; P=Pohnpeic; M=Marshallese; G=Gilbertese; K=Kosraean

e: exclusive

p: supporting

q: conflicting

s: subgroupiness

(Too little data for anything conclusive)

SUBG	<i>e</i>	<i>p</i>	<i>q</i>	<i>s</i>
CNG	2	4.56	1.12	7.66
CNM	0.67	3.4	1.24	1.76
CPN	0.6	3.38	1.1	1.74

C=Chuukic; P=Pohnpeic; M=Marshallese; G=Gilbertese; N=Nauruan

e: exclusive

p: supporting

q: conflicting

s: subgroupiness

When is a tree-like signal present in such results?

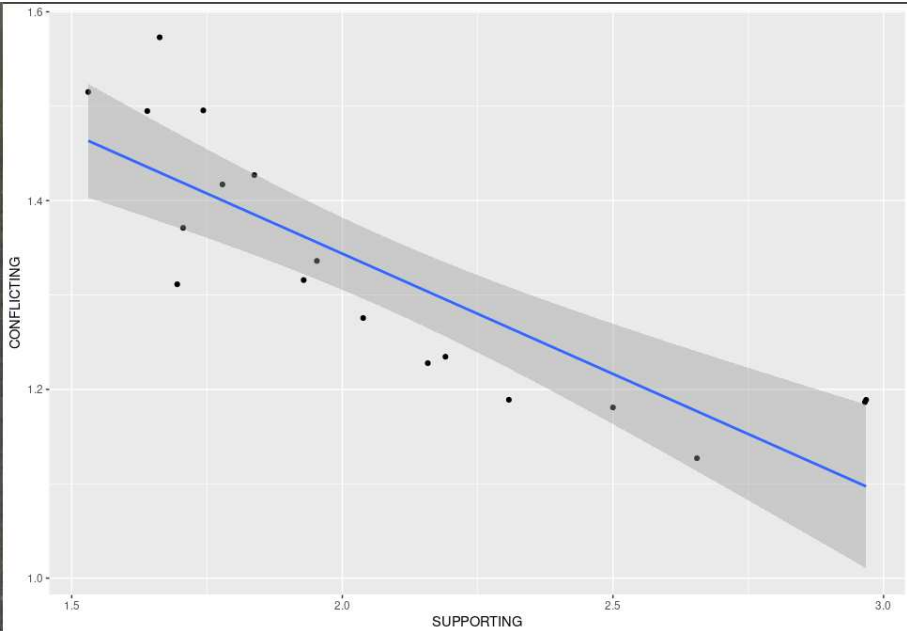
- Some non-overlapping subsets of languages stand out as having high subgroupiness, and lower-than-expected number of conflicting isoglosses
- This does not appear to be the case in the MCD

Some other observations

- Chuukic-Gilbertese is the strongest two-language subgroup, while Pohnpeic-Gilbertese is the weakest. Is this real or an artifact?
- The measures are (usefully) independent.
 - There are subgroups (Chuukic-Gilbertese, Chuukic-Pohnpeic) with a high number of both conflicting and supporting subgroups, indicating a shift or reconfiguration of the network at some point in the past

More general expectation:

- If the tree-like structure is strong, there should be a negative correlation between supporting and conflicting isogloss counts



Negative correlation between supporting and conflicting isoglosses

- It appears that this correlation holds only for “the worst” subgroups (where $p_r \leq 3$; Pearson's correlation test: $r = -0.84, p < 0.001$)

Is the proposed calibration method the correct one?

- If raw numbers rather than calibrated numbers are used, Central and Western Micronesian come out as better subgroups
 - Does this represent reality or biases in the data set?
 - I.e. were the compilers of the MCD guided by their subgrouping assumptions and specifically looked for cognatesets supporting Central and Western Micronesian?
- Potential answer to these questions: Bayesian phylogenetic analysis (in progress)
- But we can make an interim conclusion: Micronesian appears to be a typical Oceanic linkage

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